

REMARKS

Claims 4 and 24-36 have been cancelled in this response without prejudice to reinserting these claims at a later date.

Claims 1-22 were rejected under the second paragraph 35 USC §112, as being indefinite and claims 1, 9, and 15 were rejected under the second paragraph of 35 USC § 112, as being incomplete. According to the Office Action, these rejections are based on the failure of claim 1 to include a filtration means. Accordingly, claim1 has been amended to specify that the first and second continuous flow paths each include a filtration means. Claims 2, 3 and 5 have been amended to conform with this amendment of independent claim 1.

Claims 1-22 were also rejected under second paragraph of 35 USC § 112 as being indefinite and under the second paragraph of 35 USC § 112 as being incomplete for failing to better define the term “flowpath”. These rejections are respectfully traversed.

The term “flowpath” is neither indefinite nor incomplete. The term “flowpath” is a well recognized structural term of art which means any arrangement of elements, including conduits, pipes, lines, tubing, channels, manifolds, filters, housing, or other structures, which define a passage for fluid. In particular, the phrase “a first continuous flowpath for circulation of fluid” in claim 1 means any structural arrangement of elements which defines a passage for circulation of fluid therearound. Similarly, the phrase “a second continuous flowpath for circulation of fluid” means any structural arrangement of elements which defines a passage for fluid therearound. Thus, the term “flowpath” is indeed structural and, although it is broad, it is not indefinite.

Further, by use of structural term “flowpath” none of the claims are incomplete. Again, the term “flowpath” is a broad structural term which includes any arrangement of elements which define a fluid passage. Although, this term is broad, there is no omitted structural relationship or element because the “first continuous flowpath” and the “second continuous flowpath” provide the necessary structural features to complete the claim. The flowpaths may be configured in a wide variety of ways and the specification provides several examples, including lines 17-21 of page 12 and lines 14-20 of page 16. These are only examples and one skilled in the art would recognize that many different arrangements of different elements could be used to define the continuous flowpaths. Consequently, the rejections under the second paragraph of 35 USC § 112, based on the term “flowpath” are traversed.

Claims 1-7, 9, 10, and 12-22 were rejected under 35 USC § 103(a) as being unpatentable over Hartman (U.S. Patent No. 5,693,229, hereinafter the '229 patent). This rejection is respectfully traversed.

Independent claim 1 defines a filtration system including "a first continuous flowpath for circulation of fluid therearound" and "a second continuous flowpath for circulation of fluid therearound after said circulation around said first continuous flowpath". Further, independent claims 10 and 22 define a filtration system which is selectively operable in a first state in which fluids circulates around a first continuous flowpath and in a second state in which fluids circulate around a second continuous flowpath. These features are not disclosed in the '229 patent.

Referring to '229 patent, the Office Action states that the "system is also structured to perform concentration by recirculating retentate [in ?] two different flowpaths, e.g., by recirculating back to the vessel or container, or by isolating the vessel and passing the retentate back to the filters directly to a feed pump and to a feed conduit, as shown in Figures 2 and 5 of reference '229." In view of this comment, it would appear that the Office Action is equating the first continuous flowpath of claim 1 with the flowpath shown in Figure 2 of the '229 patent, and the second continuous flowpath of claim 1 with the flowpath shown in Figure 5 of the '229 patent. However, the systems shown in Figures 2 and 5 of the '229 patent are separate, alternative systems. They are not different ways of operating the same system. This is made clear by the wording of the '229 patent. For example, line 59 of column 9 of the '229 patent refers to "Exemplary embodiments". In other words, the embodiments shown in Figures 1-5 of the '229 patent are different systems, not alternative ways of using the same system. Additionally, lines 6 and 7 of column 2 of the '229 patent describe Figure 5 as "a schematic representation of a single-step thickening apparatus." These lines do not state that Figure 5 represents an alternative way of operating the same apparatus that is shown in Figure 2. Moreover, the use of the indefinite article makes it clear that the Figure 5 embodiment is a different embodiment to what has been described above. Further, lines 56 and 57 of column 4 state that "FIG. 5 shows a variant of the already described apparatuses."

There is no teaching or suggestion in the '229 patent that the systems shown in Figure 2 and in Figure 5 could be embodied as alternative ways of operating the same apparatus. Figure 2 does not show any line representing a passage allowing the vessel 5 to be bypassed. On the other hand, Figure 5 does not show the vessel 5 at all. This clearly evidences that fact that Figure 2 and 5 relate to separate apparatuses.

The Office Action also alleges, referring to the '229 patent, that "means for controlling the recirculation operation are also provided, e.g., a control system including a control valve (11)." The purpose of the control valve 11 is to restrict, to a greater or lesser degree fluid flow along return line 3. This, in turn, serves to control the transmembrane pressure in the passes 1, 2, 1''. This is made clear in lines 42-48 of column 2, in lines 56-61 of column 2, and in lines 36-38 of column 3. Control valve 11 does not divert fluid flow along alternative flow paths; there are no alternative flow paths as alleged in the Office Action. In this regard, for the avoidance of any doubt, it is respectfully pointed out that the dotted lines 14 and 15' in Figure 2 represent electrical control lines. This is made clear in lines 42-47 of column 2, and in lines 7 to 13 of column 4 of the '229 patent.

Accordingly, it is respectfully contended that the '229 patent nowhere shows first and second continuous flowpaths as required in independent claims 1, 10, and 22.

These claims are patentable over '229 patent for many other reasons. For example, each of these claims defines a filtration system in which the volume of the second continuous flowpath is lower than the volume of the first continuous flowpath. Because the '229 patent fails to disclose first and second flowpaths, it certainly fails to disclose any volumetric relationship between the flowpaths. Recognizing this failure of the '229 patent, the Office Action states that the volume circulating in the flowpath does not constitute a structure of the apparatus." This statement is respectfully traversed. The volumes referred to in independent claims 1, 10 and 22 relate to the volumes of the flowpaths, not to the volumes of liquid circulating in the flowpaths. Thus, the volumes of the flowpaths most certainly are structural features of the apparatus, structural features which are nowhere disclosed or suggested in the '229 patent.

Independent claim 1 defines a filtration system comprising means for passing fluid to the second continuous flowpath from the portion of the first continuous flowpath which is not included in the second continuous flowpath in response to said filtration of fluid circulating around second continuous flowpath. There is simply no disclosure or suggestion of anything even remotely relating to this feature in the '229 patent.

The inventions defined by independent claims 1, 10, and 22 provide many advantages over the prior art. For example, residual retentate is reduced by the use of a second continuous flowpath having a lower volume than the first continuous flowpath. Once there is insufficient fluid to fill the first continuous flowpath, unfiltered, residual retentate is retained in the portion of the first continuous flowpath which is not included in the second continuous flowpath. Fluid retained in this portion is passed to the second continuous flowpath in response to filtration of fluid circulating around the second continuous flowpath. In this way,

at least some of the residual unfiltered retentate from the first continuous flowpath is filtered in the second continuous flowpath. As a second continuous flowpath has a lower volume than the first continuous flowpath, the final amount of residual retentate, e.g., in the second continuous flowpath, is much lower than in the system having only a single fluid flow path.

Accordingly, it is respectfully submitted that independent claims 1, 10 and 22 are novel and patentable over the '229 patent.

Independent claim 19 defines a filtration system comprising a plurality of filters and a manifold connected to each filter for circulation of fluid through the manifold and through, in parallel, the filter flowpaths, wherein the system is selectively operable to pass fluid from the manifold to at least one but not all the filters. The '229 patent fails to disclose or suggest anything remotely similar to these features. Consequently, independent claim 19 is patentable over the '229 patent.

It is respectfully contended that the Office Action is incorrect with regard to a couple of other points. Page 4 of the Office Action notes, referring to claim 5, that a "plurality of filters are disclosed in reference '229 (elements 1, 2), the system is also adapted to exclude some of the filters or one of the membrane filter from a particular flow path (Fig. 5)". It is respectfully submitted this is incorrect as explained above. Figure 5 is not alternative way of operating the Figure 2 system. The systems shown in Figures 2 and 5 are separate alternatives systems and there is no suggestion to use a single system that can be operated in two different ways.

Further, the Office Action states "as to claims 8 and 11, bypassing part of the manifolds, e.g., feed conduits manifolds is suggested in reference '229 e.g., by suggesting recirculation of the concentrate directly to a first pump...is eliminated in the feed manifold". Again, it is respectfully submitted that this is incorrect. There is no suggestion in the '229 patent to use a single system which is operable in two different ways, as explained in detail above.

Finally, page 4 of the Office Action refers to Figure 4 of the '229 patent. Again, for the reasons given above, it is respectfully pointed out that Figure 4 is yet another different, alternative system to those shown in the other figures.

Conclusion

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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